

Claims

- [c1] 1.A current reference circuit comprising:
a first n-channel field effect transistor (NFET) having a gate and a drain that are coupled together; and
a second NFET having a floating body.
- [c2] 2.The current reference circuit of claim 1 wherein the first NFET includes a body that is grounded.
- [c3] 3.The current reference circuit of claim 2 wherein the first and the second NFETs comprise silicon-on-insulator field effect transistors.
- [c4] 4.The current reference circuit of claim 3 wherein the second NFET includes a gate that is coupled to the gate of the first NFET.
- [c5] 5.The current reference circuit of claim 4 further comprising a resistive element and wherein:
the first NFET includes a source that is grounded; and
the second NFET includes a source that is coupled to ground via the resistive element.
- [c6] 6.The current reference circuit of claim 5 further comprising:

a first p-channel field effect transistor (PFET) having:
a gate;
a drain coupled to the drain of the first NFET; and
a source adapted to couple to a supply voltage; and
a second PFET having:
a gate coupled to the gate of the first PFET;
a drain coupled to the gate of the second PFET and the
drain of the second NFET; and
a source adapted to couple to the supply voltage.

[c7] 7.The current reference circuit of claim 5 wherein the
supply voltage comprises a voltage of about 0.5 volts.

[c8] 8.The current reference circuit of claim 5 further com-
prising:
a third NFET having:
a gate and a drain that are coupled together; and
a source coupled to the drain of the first NFET; and
a fourth NFET having:
a gate coupled to the gate of the third NFET; and
a source coupled to the gate of the fourth NFET and the
drain of the second NFET.

[c9] 9.The current reference circuit of claim 8 wherein the
fourth NFET includes a drain and further comprising:
a first PFET having:
a gate; and

a drain coupled to the drain of the third NFET; and
a second PFET having:
a gate coupled to the gate of the first PFET; and
a drain coupled to the gate of the second PFET and the
drain of the fourth NFET.

[c10] 10. The current reference circuit of claim 9 wherein the
first PFET and the second PFET each include a source and
further comprising:
a third PFET having:
a gate;
a drain coupled to the source of the first PFET; and
a source adapted to couple to a supply voltage; and
a fourth PFET having:
a gate coupled to the gate of the third PFET;
a drain coupled to the gate of fourth PFET and the source
of the second PFET; and
a source adapted to couple to the supply voltage.

[c11] 11. The current reference circuit of claim 10 wherein the
supply voltage comprises a voltage of about 3.3 volts.

[c12] 12. A method of providing a reference current compris-
ing:
providing a current reference circuit having:
a first n-channel field effect transistor (NFET) having a
gate and a drain that are coupled together; and

a second NFET having a floating body; and
employing the current reference circuit to generate a
reference current within at least one of the first NFET and
the second NFET.

[c13] 13.The method of claim 12 wherein the first and the
second NFETs comprise silicon-on-insulator field effect
transistors.

[c14] 14.The method of claim 12 wherein the second NFET in-
cludes a gate that is coupled to the gate of the first
NFET.

[c15] 15.The method of claim 14 wherein the current reference
further comprises a resistive element and wherein:
the first NFET includes a source that is grounded; and
the second NFET includes a source that is coupled to
ground via the resistive element.

[c16] 16.The method of claim 15 wherein the current reference
circuit further comprises:
a first p-channel field effect transistor (PFET) having:
a gate;
a drain coupled to the drain of the first NFET; and
a source adapted to couple to a supply voltage; and
a second PFET having:
a gate coupled to the gate of the first PFET;

a drain coupled to the gate of the second PFET and the drain of the second NFET; and
a source adapted to couple to the supply voltage.

[c17] 17. The method of claim 15 further comprising employing about a 0.5 volt supply voltage to drive the current reference circuit.

[c18] 18. The method of claim 15 wherein the current reference circuit further comprises:

a third NFET having:

a gate and a drain that are coupled together; and

a source coupled to the drain of the first NFET;

a fourth NFET having:

a drain;

a gate coupled to the gate of the third NFET; and

a source coupled to the gate of the fourth NFET and the drain of the second NFET;

a first PFET having:

a source;

a gate;

a drain coupled to the drain of the third NFET;

a second PFET having:

a source;

a gate coupled to the gate of the first PFET; and

a drain coupled to the gate of second PFET and the drain of the fourth NFET;

a third PFET having:
a gate;
a drain coupled to the source of the first PFET; and
a source adapted to couple to a supply voltage; and
a fourth PFET having:
a gate coupled to the gate of the third PFET;
a drain coupled to the gate of fourth PFET and the source
of the second PFET; and
a source adapted to couple to the supply voltage.

[c19] 19.The method of claim 18 further comprising employ-
ing about a 3.3 volt supply voltage to drive the current
reference circuit.

[c20] 20.A current reference circuit comprising:
a first n-channel field effect transistor (NFET) having a
gate and a drain that are coupled together; and
a second NFET having a floating body;
wherein the first and second NFETs are configured so as
to generate a reference current at a supply voltage of not
more than about 0.5 volts.